



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

February 6, 2015

Crystal Layton
Agent for Old Bridge Chemicals, Inc.
PO Box 5126
Valdosta, GA 31603

Subject: Label Amendment – CRP certification for consumer use label version; adding freshwater snail control; wood treatment use deletion per FR published 10/17/14; revisions for compliance and clarity.
Product Name: Copper Sulfate Fine Crystals
EPA Registration Number: 46923-4
Application Date: 2/18/2014
Decision Number: 488221

Dear Ms. Layton:

The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one copy of the final printed labeling before you release the product for shipment with the new labeling. In accordance with 40 CFR 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

Your release for shipment of the product constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6. If you have any questions, please contact Lindsay Roe by phone at 703-347-0506, or via email at roe.lindsay@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Tony Kish". The signature is fluid and cursive, with the first name "Tony" and last name "Kish" clearly distinguishable.

Tony Kish, Product Manager 22
Fungicide Branch
Registration Division (7505P)
Office of Pesticide Programs

Enclosure

COMMERCIAL LABEL*Old Bridge Chemicals, Inc.***COPPER SULFATE FINE CRYSTALS**

Net Weight: 50, 2000 pounds (22.68, 907.2 Kg) EPA Reg. No. 46923-4
EPA Est. No. 46923-NJ-1

ACTIVE INGREDIENT

Copper Sulfate Pentahydrate*: CAS # 7758-99-899.0%

OTHER INGREDIENTS.....1.0%

TOTAL.....100%

*Metallic Copper Equivalent: 25.2%

ACCEPTED**02/06/2015**

Under the Federal Insecticide, Fungicide
and Rodenticide Act as amended, for the
pesticide registered under
EPA Reg. No. 46923-4



Certified to ANSI/NSF 60

KEEP OUT OF REACH OF CHILDREN**DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

ATTENTION: This product contains chemicals known to the State of California to cause cancer and birth defects.

FIRST AID

| | |
|------------------------|--|
| If in eyes | <ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice. |
| If swallowed | <ul style="list-style-type: none">• Call poison control center or doctor immediately for treatment advice.• Have person sip a glass of water if able to swallow.• Do not induce vomiting unless told to do so by the poison control center or doctor.• Do not give anything to an unconscious person. |
| If inhaled | <ul style="list-style-type: none">• Move person to fresh air.• If person is not breathing call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.• Call poison control center or doctor for treatment advice. |
| If on skin or clothing | <ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15-20 minutes.• Call the poison control center or doctor for treatment advice. |

HOT LINE SERVICE

Have the product container or label with you when calling a poison control center or doctor, or for going for treatment. You may contact 800-275-3924 for emergency medical information.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

See additional precautionary statements and directions for use [on side/back panel] [inside pamphlet, booklet, leaflet]

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Corrosive. Causes irreversible eye damage. May be fatal if swallowed. Do not get in eyes or on clothing. For applications in waters destined for use as drinking water, those waters must receive additional and separate potable water treatment. Do not apply more than 1.0 ppm as metallic copper to these waters.

PERSONAL PROTECTIVE EQUIPMENT

Mixers, Loaders, Applicators and other handlers must wear the following:

- Long sleeve shirt,
- long pants,
- shoes plus socks,
- protective eyewear such as glasses with side shields,
- chemical resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride (Some materials that are chemical resistant to this product are rubber and latex. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.),
- disposable particulate dust mask NIOSH approved N95.

Follow manufacturer's instructions for cleaning or maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with product's concentrate. Do not reuse them.

USER SAFETY RECOMMENDATIONS

- Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing. Wash the outside of gloves before removing.

ENVIRONMENTAL HAZARDS

AQUATIC USES: This pesticide is toxic to fish and aquatic invertebrates. Water treated with this product may be hazardous to aquatic organisms. Treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead algae and weeds. This oxygen loss can cause fish and invertebrate suffocation. To minimize this hazard, do not treat more than ½ of the water body to avoid depletion of oxygen due to decaying vegetation. Wait at least 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State or local agency with primary responsibility for regulating pesticides before applying to public waters to determine if a permit is required.

Certain water conditions including low pH (<6.5), low dissolved organic carbon (DOC) levels (3.0 mg/L or lower), and soft waters (i.e. alkalinity less than 50 mg/L), increase the potential acute toxicity to non-target

aquatic organisms.

Restrictions: For algae use except for treatment of rice to control algae: No more than ½ of the water body may be treated at one time. For applications in waters destined for use as drinking water, those waters must receive additional and separate potable water treatment. Do not apply more than 1.0 ppm as metallic copper in these waters. For all algae use (including use of rice to control algae), the minimum retreatment interval is 14 days.

TERRESTRIAL USES: This pesticide is toxic to fish and aquatic invertebrates and may contaminate water through runoff. This product has a potential for runoff for several months or more after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. Drift and runoff may be hazardous to aquatic organisms adjacent to treated areas. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinsate.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific for your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, (40 CFR Part 170). This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouse and handlers of agricultural pesticides. It contains requirements for training, decontamination notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protection equipment (PPE), and restricted-entry period. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard. Do not enter or allow worker entry into treated areas during restricted entry interval of 48 hours. PPE required for early entry to treated areas that is permitted by the Worker Protection Standard that involves contact with anything that has been treated, such as plants, soil or water is: Coveralls, shoes plus socks, chemical resistant gloves made waterproof material such as polyethylene or polyvinyl chloride and goggles or face shield.

NON AGRICULTURAL USE REQUIREMENTS

The requirement in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when the product is used to produce agricultural plants on farms, forest, nurseries or green-houses. Applicators and other handlers who handle this product for any use NOT covered by the Worker Protection Standard (CFR 40 Part 170) must wear long sleeve shirt, chemical resistant gloves made of water-proof material such as rubber or latex, shoes plus socks and protective eyewear. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Do not allow adults, children or pets to enter treated areas until sprays have completely dried or if applied dry until dust settles.

DRIFT MANAGEMENT

A variety of factors including weather conditions, (e.g., wind direction, wind speed, temperature, relative humidity and methods application (e.g. ground application, aerial, air blast, chemigation) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

Wind Speed: Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition (approximately 3 to 10 mph) and there are no sensitive areas within 250 feet downwind.

Temperature Inversions: If applying at wind speeds less than 3 mph, the applicator must determine if (a) conditions of temperature inversion exist, or (b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions at stable atmospheric conditions.

Droplet Size: Apply only as a medium or coarse spray (ASAE Standard 572) or a mean diameter of 300 microns or greater for spinning atomizer nozzles.

Equipment: All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates.

Aerial Application: The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter. Release product at the lowest height consistent with efficacy and flight safety. Do not release at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety. When applications are made with a crosswind, the swath must be displaced downwind. The applicator must compensate for this displacement at the up and downwind edge of the application area by adjusting the path of the aircraft.

Other State and Local Requirements

Applicators must follow all state and local pesticide drift requirements regarding application of copper compounds. Where states have more stringent regulations, they must be observed.

ALGAE CONTROL

When using Copper Sulfate to control algae, there are many factors to consider such as water hardness, temperature of the water, type and quantity of vegetation to be controlled and the amount of water flow. Algae can be controlled more easily and effectively if treatment with Copper Sulfate is made soon after algae growth has started. Under such circumstances, small amounts of Copper Sulfate can effectively control algae in water. However, if treatment is delayed until large amounts of algae are present larger quantities of Copper Sulfate will be required. Control of algae in water systems is not always permanent. Usually algae is more difficult to control with Copper Sulfate when water temperatures are low. The dose rates for Copper Sulfate are based on a water temperature of 60 ° F or higher. Larger amounts of Copper Sulfate will be required in hard water. Normally, larger quantities of Copper Sulfate will be required to kill algae in water that is flowing than in a body of stagnant water. If possible, curtail the flow of water before treatment and hold dormant for about three days after treatment or until algae have begun to die. When preparing a Copper Sulfate solution in water, it is best that the mixing vessel be made of plastic or glass. Metal containers lined with plastic or painted or enameled are permissible. Galvanized containers are to be avoided. It is best to treat algae on calm, sunny days when heavy mats of filamentary algae are most likely to be floating on the surface where it can be sprayed directly. When in doubt about the concentration to be used, it is recommended to start with a lower concentration and gradually increase the concentration until the algae is killed.

CALCULATIONS FOR AMOUNT OF WATER AND COPPER SULFATE PENTAHYDRATE TO BE USED.

A. Calculate water volume as follows:

1. Obtain surface area by measuring regular shaped ponds or mapping irregular ponds or by use of a previously recorded data or maps.
2. Calculate average depth by measuring depth in a regular pattern and taking the mean of these readings or by use of previously recorded data.
3. Multiply surface area in square feet by average depth in feet to obtain cubic feet of water volume, or
4. Multiply surface area in acres by average depth in feet to obtain total acre feet of water volume. *For a body of water that contains fish, only 1/2 of the area may be treated at one time. After calculating the area of the body of water as instructed above, divide this number by 2. Use that number to calculate weight of water and amount of Copper Sulfate Pentahydrate required to treat half of the body of water.

B. Calculate weight of water to be treated as follows:

1. Multiply volume in cubic feet by 62.44 to obtain total pounds of water,
- or
2. Multiply volume in acre feet by 2,720,000 to obtain total pounds of water.

C. Calculate amount of Copper Sulfate Pentahydrate to add:

To calculate the weight of Copper Sulfate Pentahydrate needed to achieve the desired concentration, multiply the weight of water in pounds by the recommended concentration. Since the recommended concentrations are given in parts per million (ppm), first convert the value to a decimal equivalent. A value of 1 ppm is equivalent 0.000001 as a decimal value. Thus the amount of Copper Sulfate Pentahydrate required to treat 1 acre-foot (2,720,000 pounds) of water with 1 ppm of Copper Sulfate Pentahydrate would be $0.000001 \times 2,720,000 = 2.72$ lbs. Copper Sulfate Pentahydrate.

FOR SMALL PONDS: Follow the directions in “A” above. Calculate the weight of the water to be treated by multiplying the volume in cubic feet by 62.44 to obtain total pounds of water. For 1 ppm of Copper Sulfate Pentahydrate multiply the pounds by 0.000001. The result is pounds of Copper Sulfate Pentahydrate. The amount of Copper Sulfate Pentahydrate to treat a pond 100 ft. by 100 ft. by 2 ft. deep: $100 \times 100 \times 2 = 20,000 \text{ ft}^3$
 $20,000 \text{ cu ft.} \times 62.44 \text{ lbs} = 1,248,800 \text{ lbs of water} \times 0.000001 = 1.25 \text{ pounds of Copper Sulfate Pentahydrate.}$

Treatment of algae can result in oxygen loss from decomposition of dead algae. This loss can cause fish suffocation. Therefore to minimize this hazard, treat 1/3 to 1/2 of the water area in a single operation and wait 14 days between treatments. Begin treatments along the shore and proceed outwards in bands to allow fish to move into untreated water.

NOTE: If treated water is to be used as a source of potable water, the metallic copper residual must not exceed

1 ppm (4 ppm Copper Sulfate Pentahydrate).

SPECIFIC INSTRUCTIONS

CONTROL ALGAE AND THE POTAMOGETON PONDWEEDS, LEAFY SAGO, IN IRRIGATION CONVEYANCE SYSTEMS: Use the continuous application method, selecting proper equipment to supply Copper Sulfate Crystal at 0.25 to 0.5 pounds per hour for each cubic foot per second of flow for twelve hours of each 24 hours. For the best control, begin Copper Sulfate additions when water is first turned into system to be treated and continue throughout the irrigation season. Copper Sulfate Crystal becomes less effective for mature plants. Copper Sulfate Crystal becomes less effective as the bicarbonate alkalinity increases and is substantially reduced above 150 ppm as CaCO₃. Mechanical or other means may then be required to remove excess growth.

TO CONTROL ALGAE SUCH AS FILAMENTOUS GREEN PIGMENTED FLAGELLATES AND DIATOMS IN IRRIGATION CONVEYANCE SYSTEMS: Begin continuous addition when water is first turned on using suitable equipment to uniformly deliver 0.1 to 0.2 pounds of Copper Sulfate Crystal per hour per cubic foot per second of flow for 12 of each 24 hours. (note: Copper Sulfate Crystal comes in several “free flowing” crystal sizes but should be selected to match requirements of your feeder.)

TO CONTROL ALGAE IN RICE FIELDS: (Domestic and Wild): Application should be made when algae has formed on the soil surface in the flooded field. Applications are most effective when made prior to algae leaving the soil surface and rising to the surface of the water. For a 3-inch flood depth, apply Copper Sulfate at a rate of 2.72 lbs. per acre at the first sign of algae. Apply Copper Sulfate crystals to the surface of the water or dissolve in water and make a surface spray. For a 6-inch flooded depth, use 5.44 lbs. per acre. Adjust the rate according to the average water depth, not to exceed the maximum application rate of 4 ppm of Copper Sulfate (1 ppm metallic copper), which is equivalent to 10.88 lbs. of Copper Sulfate per acre-foot of water. The minimum retreatment interval is 14 days.

TO CONTROL TADPOLE SHRIMP IN RICE FIELDS: Application should be made to the flooded rice fields anytime the pest appears from planting time until the seedlings are well rooted and have emerged through the water. For a 3-inch flood depth, apply 6.75 pounds per acre. For a flood depth of 6 inches, use 13.6 lbs. per acre. Apply Copper Sulfate crystals to the surface of the water or dissolve in water and make a surface spray. Adjust the rate according to the average water depth, not to exceed the maximum application rate of 10 ppm of Copper Sulfate (2.5 ppm metallic copper), which is equivalent to 27.2 pounds of Copper Sulfate per acre of water.

TO CONTROL ALGAE IN IMPOUNDED WATER, LAKES, PONDS AND RESERVOIRS:

There are several methods by which to apply Copper Sulfate to impounded water. Probably the simplest and the most satisfactory method is to dissolve the Copper Sulfate crystals in water and spray the solution over the body of water. Copper Sulfate may be broadcast directly on the water surface from boat. A small pump mounted in the boat can easily be used for this purpose. A specially equipped air blower can be used to discharge these size crystals at a specific rate over the surface of the water. When using this method, the wind direction is an important factor. Do not use this method unless completely familiar with this type of application. Copper Sulfate is also designed to be used as a dry application from airplanes, using a maximum of 10.64 pounds per acre-foot. Where the situation permits, Copper Sulfate may be applied under the water by dragging burlap bags filled with Copper Sulfate through the water by means of a boat. Care should be taken that the course of the boat is such as to cause even distribution of the chemical. In large lakes, it is customary for the boat to travel in parallel lines about 20 to 100 feet apart.

Continue dragging the burlap bags over the treated area until the minimum dosage is achieved and all the crystals have been dissolved. For all application methods described, begin treatment along the shoreline and proceed outward until 1/3 to 1/2 of the total area has been treated. No more than 1/2 of the water body may be treated at one time. The minimum treatment interval is 14 days. If the treated water is to be used as a source of potable water, the metallic copper concentration must not exceed 1 ppm (4 ppm Copper Sulfate).

COPPER SULFATE REQUIRED FOR TREATMENT OF DIFFERENT GENERA OF ALGAE:

The genera of algae listed below are commonly found in impounded water, lakes, ponds, and reservoirs in the United States. Use the lower recommended rate of Copper Sulfate in soft waters (less than 50 ppm methyl orange alkalinity) and higher concentration in hard water (above 50 ppm alkalinity).

NOTE: Do not use concentration of 1.6 ppm Copper Sulfate (0.4 ppm metallic copper) or more where fish are present. Concentrations up 4 ppm Copper Sulfate (1 ppm metallic copper) are permitted in waters such as rice fields where fish are not present. Always consult State Fish and Game Agency before applying this product to municipal waters.

| PRODUCT CONCENTRATION: POUNDS PRODUCT/ ACRE FOOT: | ¼ to ½ ppm | ½ to 1 ppm | 1 to 1½ ppm | 1½ to 2 ppm |
|--|---|--|---|--|
| ORGANISM | | | | |
| Cyanophyceae (Blue Green) | Anabaena Anacystis Aphanizomenon Gloeotrichia Gomphosphaeria Polycystis Rivularia | Cylindrospermum Oscillatoris Pleustonema | Nostoc Phormidium | Calothrix Symploca |
| Chlorophyceae (Green) | Closterium Hydrodictyon Spirogyra Ulothrix | Botryococcus Cladophora Coelastrum Drapamaldia Enteromorpha Gloeocystis Microspora Tribonema Zygnema | Chlorella Crucigenia Desmidium Golenkinia Oocystis Palmelia Pithiphora Staurostrum Tetraedron | Ankistrodesmus Chara Nitella Scenedemus |
| Diatomaceae (Diatoms) | Asterionella Fragilaria Melorisa Navicula | Gomphonema Nitzschia Stephanodiscus Synedra Tabellaria | Achnanthes Cymbella Neidum | |
| Protozoa (Flagellates) | Dinobryon Synura | Ceratium Cryptomonas | Chlamydomonas Haematococcus | Eudorina Pandorina |

Uroglena
Volvox

Euglena
Glenodinium
Mallomonase

Peridinium

CONTROL OF ALGAE AND BACTERIAL ODORS IN SWIMMING POOLS

To treat and prevent algae and odors, apply 1 tablespoon of Copper Sulfate Fine Crystals for every thousand gallons of pool water. This will result in a concentration of 1.0 ppm of dissolved copper. Prior to application, the pH of the pool should be 7.2-7.6. Dissolve the Copper Sulfate Fine Crystals in water in a plastic container and pour the solution into the pool around the edge of the pool. Never add Copper Sulfate Fine Crystals while swimming. As soon as the solution disperses in the pool water, you may reenter the pool.

Using a copper test kit (this may be purchased at any pool supply store) check copper levels every 2 weeks. As needed, apply a maintenance dosage of ½ tablespoon per thousand gallons of pool water to maintain a 0.7 to 1.0 ppm concentration. Do not exceed a 1.0 ppm copper concentration. Prior to application, the pH of the pool should be 7.2-7.6. Dissolve the required amount of Copper Sulfate Fine Crystals in a plastic container and pour the solution into the pool around the edge of the pool.

Most pool shock products may be used with this product. During heavy usage, shock pool once a week and use a filter clarifier. Copper Sulfate Fine Crystals is a very simple and easy way to maintain your pool water looking crystal clear year round with very little maintenance. When used as directed Copper Sulfate Fine Crystals may be used for all pools (consult your pool professional on plaster or finished concrete pools before adding).

[Optional Claims:] This Pool Maintenance formula: Is simple to use; Has no chlorine smells; May be used with any type of filter system; Controls algae and bacterial odors; Has very little effect on pH; Unlike other products Copper Sulfate Fine Crystals will not evaporate out of your water; Compatible with most pool chemicals.

FRESHWATER SNAIL CONTROL

To kill parasites causing "swimmers itch" it is necessary to kill the various species of host snails with a maximum 1.5 ppm Copper Sulfate Fine Crystals (0.375 ppm metallic copper). In a body of water containing fish, only half of the area may be treated at once. Use the section CALCULATIONS FOR AMOUNT OF WATER AND COPPER SULFATE PENTAHYDRATE TO BE USED to calculate the amount of Copper Sulfate Pentahydrate crystals you will need to apply to the area to be treated. Apply Copper Sulfate crystals to the surface of the water or dissolve in water and make a surface spray. Keep swimmers and livestock out of the pond for 5 days following treatment; doubling this period in very soft waters. Do not make more than two applications per year. In the case where only half of the pond is being treated, it counts as half an application. In the state of New York, copper sulfate is considered a restricted use pesticide for snail control.

SEWER TREATMENT-ROOT DESTROYER ROOT CONTROL GENERAL INFORMATION

Plant roots can penetrate through small cracks and poorly sealed joints of sewer lines. If not controlled, these small roots will continue to grow larger in number causing breakage, reduced flow and eventually flow stoppage. This is an effective means to control roots in residential and commercial sewers.

COMMERCIAL, INSTITUTIONAL AND MUNICIPAL SEWERS ROOT CONTROL IN SEWERS.

As a preventative measure, apply directly into each junction or terminal manhole by pouring a maximum of two pounds of this product every 6 to 12 months. At time of reduced flow (some water is essential) add this product. If flow has not completely stopped, but has a reduced flow due to root masses, add this product in the next manhole above the reduced flow area. For complete stoppage, penetrate the mass with a rod to enable some flow before treatment.

ROOT CONTROL IN STORM RAINS:

Apply when water flow is light. If no water flow, as in dry weather, use a hose to produce a flow.

Apply 2 pounds of this product by pouring directly into drain. No more than 2 pounds of product may be applied per drain per year.

SEWER PUMPS AND FORCE MAINS:

At the storage well inlet, place a cloth bag containing 2 lbs of this product. Repeat every six months if necessary.

RESIDENTIAL OR HOUSEHOLD SEWER SYSTEMS:

When a reduced water flow is first noticed, and root growth is thought to be the cause, treat with this product. It is important not to wait until a stoppage occurs because some water flow is necessary to move this product to the area of root growth. Usually, within 3 to 4 weeks, after roots have accumulated sufficient Copper Sulfate Pentahydrate, the roots will die and begin to decay and water flow should increase. As the roots re-grow, follow-up treatments with this product may be required every 6 months. Applications may be made each year in the spring after plant growth begins, during late summer or early fall, or anytime a reduced water flow, thought to be caused by root growth, occurs. Apply 1 pound of this product every six months to household sewers. Add this product to sewer lines by pouring about ½ pound increments into the toilet bowl nearest the sewer line and flush. Repeat this process until recommended dose has been added. Or remove cleanout plug and pour entire recommended quantity directly into the sewer line. Replace the plug and flush toilet several times. Do not apply Copper Sulfate through sink or tub as it will corrode metal drains. If system is equipped with septic tank, Copper Sulfate will precipitate in the septic tank and little will pass into the absorption drain field. To treat drain field pipes, add 2 pounds of Copper Sulfate once a year to the distribution box located between the septic tank and the drain field. If the distribution box does not have an opening, it would be advisable to install a clean out plug opening into the outlet pipe from the septic tank leading to the drain field for effective root control in the drain field pipes.

***NOTE:** Do not use a sewer additive where prohibited by State Law. State Law prohibits the use of this product in sewer systems in the State of Connecticut. Not for sale or use in California counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma for root control in sewers. Not for sale or use in septic systems in the State of Florida.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Pesticide Storage: Store in a cool and dry place. If paper bag, super sack, or jug is damaged place in a plastic bag. Shovel any spills into a plastic bag and seal with tape. Keep pesticide in original container. Do not put concentrate or dilutions of concentrate in food or drink containers.

Pesticide Disposal: Pesticide wastes may be hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional office for guidance.

Container Handling: Non-refillable container: Do not reuse or refill this container.

Super Sack and Paper Bags: Completely empty bag into application equipment, then offer for recycling if available or dispose of empty bag in a sanitary landfill or by incineration or if allowed by state and local authorities, by burning. If burned, stay out of smoke. **Plastic Jugs:** Triple rinse container promptly after emptying. Triple rinse as follows: Empty remaining contents into application equipment or mix tank. Fill the container ¼ full with water and recap. Shake for ten seconds. Pour rinsate into application equipment or a mix tank or store for future use or disposal. Drain for 10 seconds after flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, if available, or puncture and dispose of in a sanitary landfill, or, if allowed by State and Local authorities, by burning. If burning, stay out of smoke.

CONDITION OF SALE

LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read and follow all package directions carefully. Purchaser and user assume all risks associated with improper use, or application or other factors beyond Old Bridge's control. Old Bridge warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the risks referred above. **OLD BRIDGE MAKES NO AND THE LAW SHALL NOT FIND ANY EXPRESSED OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** To the extent consistent with applicable law, purchaser's use and sole remedy against Old Bridge for any cause of action related to the handling or use of this product shall be for damages, for the amount of which shall not exceed the price paid for the product that causes the alleged loss, damages, injury, or other claim to the extent consistent with applicable law. In no event shall Old Bridge be liable for special, indirect, incidental or consequential damages or expenses. By purchasing or using this product, purchaser or user accept the foregoing conditions of sale and limitation of warranty, liability, and remedies.

ENVIRONMENTALLY HAZARDOUS SUBSTANCE

**SOLID, N.O.S. (CUPRIC SULFATE),
9,UN3077, PGIII, RQ CASE NO. 7758-99-8**

For Technical Information and MSDS Call Old Bridge Chemicals
at (732) 727-2225

or e-mail: Sales@OldBridgeChem.com

OLD BRIDGE CHEMICALS, INC

554 Waterworks Road

Old Bridge, New Jersey 08857

NON-COMMERCIAL LABEL FOR HOUSEHOLD USE

Old Bridge Chemicals, Inc.

COPPER SULFATE FINE CRYSTALS

Net Weight:, 5 pounds (2.267 Kg), 15 pounds (6.803 Kg)

EPA Reg. No. 46923-4

EPA Est. No. 46923-NJ-1

ACTIVE INGREDIENT

Copper Sulfate Pentahydrate*: CAS # 7758-99-899.0%

OTHER INGREDIENTS.....1.0%

TOTAL.....100%

*Metallic Copper Equivalent: 25.2%



Certified to ANSI/NSF 60

KEEP OUT OF REACH OF CHILDREN

DANGER/PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

ATTENTION: This product contains chemicals known to the State of California to cause cancer and birth defects.

| FIRST AID | |
|--|--|
| If in eyes | <ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice. |
| If swallowed | <ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Have person sip a glass of water if able to swallow.• Do not induce vomiting unless told to do so by the poison control center or doctor.• Do not give anything to an unconscious person. |
| If inhaled | <ul style="list-style-type: none">• Move person to fresh air.• If person is not breathing call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.• Call poison control center or doctor for treatment advice. |
| If on skin or clothing | <ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15-20 minutes.• Call poison control center or doctor for treatment advice. |
| HOT LINE SERVICE | |
| Have the product container or label with you when calling a poison control center or doctor, or for going for treatment. You may contact 800-275-3924 for emergency medical information. | |
| NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. | |

See additional precautionary statements and directions for use [on side/back panel] [inside pamphlet, booklet, leaflet]

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Corrosive. Causes irreversible eye damage. May be fatal if swallowed. Do not get in eyes or on clothing. For applications in waters destined for use as drinking water, those waters must receive additional and separate potable water treatment. Do not apply more than 1.0 ppm as metallic copper to these waters.

PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear the following:

- Long sleeve shirt,
- long pants,
- shoes plus socks,
- protective eyewear such as goggles, face shield or safety glasses,
- chemical resistant gloves made of any waterproof material. Some materials that are chemical resistant to this product are polyvinyl chloride, nitrile rubber or butyl rubber. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection chart.

Follow manufacturer's instructions for cleaning or maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with product's concentrate. Do not reuse them.

USER SAFETY RECOMMENDATIONS

- Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

AQUATIC USES: This product is toxic to fish and aquatic invertebrates. Water treated with this product may be hazardous to aquatic organisms. Treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead algae and weeds. The oxygen loss can cause fish and invertebrate suffocation. To minimize this hazard, do not treat more than ½ of the water body to avoid depletion of oxygen due to decaying vegetation. Wait at least 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State or local agency with primary responsibility for regulating pesticides before applying to public waters to determine if a permit is required.

Certain water conditions including low pH (<6.5), low dissolved organic carbon (DOC levels (3.0 mg/L or lower), and soft waters (i.e. Alkalinity less than 50 mg/L), increase the potential acute toxicity to non-target aquatic organisms.

TERRESTRIAL USES: This pesticide is toxic to fish and aquatic invertebrates and may contaminate water through runoff. This product has a potential for runoff for several months or more after application. Poorly

drained soils and soils with shallow water tables are more prone to produce runoff that contains this product. Drift and runoff may be hazardous to aquatic organisms adjacent to treated areas. Do not apply directly to water, or to area where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinsate.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact adults, children, or pets, either directly or through drift. Do not allow adults, children, or pets to enter the treated area until dusts have settled.

GENERAL INSTRUCTIONS FOR USE IN ALGAE CONTROL

When using Copper Sulfate to control algae, there are many factors to consider such as water hardness, temperature of the water, type and quantity of vegetation to be controlled and the amount of water flow. Algae can be controlled more easily and effectively if treatment with Copper Sulfate is made soon after algae growth has started. Under such circumstances, small amounts of Copper Sulfate can effectively control algae in water. However, if treatment is delayed until large amounts of algae are present larger quantities of Copper Sulfate will be required. Control of algae in water systems is not always permanent. Usually algae is more difficult to control with Copper Sulfate when water temperatures are low. The dose rates for Copper Sulfate are based on a water temperature of 60 °F or higher. Larger amounts of Copper Sulfate will be required in hard water. Normally, larger quantities of Copper Sulfate will be required to kill algae in water that is flowing than in a body of stagnant water. If possible, curtail the flow of water before treatment and hold dormant for about three days after treatment or until algae have begun to die. When preparing a Copper Sulfate solution in water, it is best that the mixing vessel be made of plastic or glass. Metal containers lined with plastic or painted or enameled are permissible. Galvanized containers are to be avoided. It is best to treat algae on calm, sunny days when heavy mats of filamentary algae are most likely to be floating on the surface where it can be sprayed directly. When in doubt about the concentration to be used, it is recommended to start with a lower concentration and gradually increase the concentration until the algae is killed.

CALCULATIONS FOR AMOUNT OF WATER AND COPPER SULFATE PENTAHYDRATE TO BE USED

A. Calculate water volume as follows:

1. Obtain surface area by measuring regular shaped ponds or mapping irregular ponds or by use of a previously recorded data or maps.
2. Calculate average depth by measuring depth in a regular pattern and taking the mean of these readings or by use of previously recorded data.
3. Multiply surface area in square feet by average depth in feet to obtain cubic feet of water volume, or
4. Multiply surface area in acres by average depth in feet to obtain total acre feet of water volume.

*For a body of water that contains fish, only 1/2 of the area may be treated at one time. After calculating the area of the body of water as instructed above, divide this number by 2. Use that number to calculate weight of water and amount of Copper Sulfate Pentahydrate required to treat half of the body of water.

B. Calculate weight of water to be treated as follows:

1. Multiply volume in cubic feet by 62.44 to obtain total pounds of water, or
2. Multiply volume in acre feet by 2,720,000 to obtain total pounds of water.

C. Calculate amount of Copper Sulfate Pentahydrate to add:

To calculate the weight of Copper Sulfate Pentahydrate needed to achieve the desired concentration, multiply the weight of water in pounds by the recommended concentration. Since the recommended concentrations are given in parts per million (ppm), first convert the value to a decimal equivalent. A value of 1 ppm is equivalent 0.000001 as a decimal value. Thus the amount of Copper Sulfate Pentahydrate required to treat 1 acre-foot (2,720,000 pounds) of water with 1 ppm of Copper Sulfate Pentahydrate would be $0.000001 \times 2,720,000 = 2.72$ lbs. Copper Sulfate Pentahydrate.

FOR SMALL PONDS: Follow the directions in “A” above. Calculate the weight of the water to be treated by multiplying the volume in cubic feet by 62.44 to obtain total pounds of water. For 1 ppm of Copper Sulfate Pentahydrate multiply the pounds by 0.000001. The result is pounds of Copper Sulfate Pentahydrate. The amount of Copper Sulfate Pentahydrate to treat a pond 100 ft. by 100 ft. by 2 ft. deep:

$$100 \times 100 \times 2 = 20,000 \text{ ft}^3$$

$$20,000 \text{ cu ft.} \times 62.44 \text{ lbs} = 1,248,800 \text{ lbs of water} \times 0.000001 = 1.25 \text{ pounds of Copper Sulfate Pentahydrate.}$$

Treatment of algae can result in oxygen loss from decomposition of dead algae. This loss can cause fish suffocation. Therefore to minimize this hazard, treat $\frac{1}{3}$ to $\frac{1}{2}$ of the water area in a single operation and wait 14 days between treatments. Begin treatments along the shore and proceed outwards in bands to allow fish to move into untreated water. NOTE: If treated water is to be used as a source of potable water, the metallic copper residual must not exceed 1 ppm (4 ppm Copper Sulfate Pentahydrate).

SPECIFIC INSTRUCTIONS

TO CONTROL ALGAE IN IMPOUNDED WATER, LAKES AND PONDS: There are several methods by which to apply Copper Sulfate to impounded water. Probably the simplest and the most satisfactory method is to dissolve the Copper Sulfate crystals in water and spray the solution over the body of water. A small pump mounted in the boat can easily be used for this purpose. Copper Sulfate may be broadcast directly on the water surface from a boat. Where the situation permits, Copper Sulfate may be applied under the water by dragging burlap bags filled with Copper Sulfate through the water by means of a boat. Care should be taken that the course of the boat is such as to cause even distribution of the chemical. In large lakes, it is customary for the boat to travel in parallel lines about 20 to 100 feet apart. Continue dragging the burlap bags over the treated area until the minimum dosage is achieved and all the crystals have been dissolved. For all application methods described, begin treatment along the shoreline and proceed outward until $\frac{1}{3}$ to $\frac{1}{2}$ of the total area has been treated. No more than half of the water body may be treated at a time. The minimum treatment interval is 14 days. If the treated water is to be used as a source of potable water, the metallic copper concentration must not exceed one ppm (4 ppm Copper Sulfate).

COPPER SULFATE REQUIRED FOR TREATMENT OF DIFFERENT GENERA OF ALGAE:

The genera of algae listed below are commonly found in impounded water, lakes, ponds, and reservoirs in the United States. Use the lower recommended rate of Copper Sulfate in soft waters (less than 50 ppm methyl orange alkalinity) and higher concentration in hard water (above 50 ppm alkalinity).

NOTE: Do not use concentration of 1.6 ppm Copper Sulfate (0.4 ppm metallic copper) or more where fish are present. Concentrations up 4 ppm Copper Sulfate (1 ppm metallic copper) are permitted in waters where fish are not present. Always consult State Fish and Game Agency before applying this product to municipal waters.

| PRODUCT CONCENTRATION: | ¼ to ½ ppm | ½ to 1 ppm | 1 to 1½ ppm | 1½ to 2 ppm |
|---------------------------------------|---|--|---|--|
| POUNDS PRODUCT/ ACRE FOOT: | .67 to 1.3 | 1.3 to 2.6 | 2.6 to 3.9 | 3.9 to 5.3 |
| ORGANISM | | | | |
| Cyanophyceae (Blue Green) | Anabaena Anacystis Aphanizomenon Gloeotrichia Gomphosphaeria Polycystis Rivularia | Cylindrospermum Oscillatoris Pleustonema | Nostoc Phormidium | Calothrix Symploca |
| Chlorophyceae (Green) | Closterium Hydrodictyon Spirogyra Ulothrix | Botryococcus Cladophora Coelastrum Drapamaldia Enteromorpha Gloeocystis Microspora Tribonema Zygnema | Chlorella Crucigenia Desmidium Golenkinia Oocystis Palmelia Pithiphora Staurostrum Tetraedron | Ankistrodesmus Chara Nitella Scenedemus |
| Diatomaceae (Diatoms) | Asterionella Fragilaria Melorisa Navicula | Gomphonema Nitzschia Stephanodiscus Synedra Tabellaria | Achnanthes Cymbella Neidium | |
| Protozoa (Flageliates) | Dinobryon Synura Uroglana Volvox | Ceratium Cryptomonas Euglena Glenodinium Mallomonase | Chlamydomonas Haematococcus Peridinium | Eudorina Pandorina |

CONTROL OF ALGAE AND BACTERIAL ODORS IN SWIMMING POOLS

To treat and prevent algae and odors, apply 1 tablespoon of Copper Sulfate Fine Crystals for every thousand gallons of pool water. This will result in a concentration of 1.0 ppm of dissolved copper. Prior to application, the pH of the pool should be 7.2-7.6. Dissolve the Copper Sulfate Fine Crystals in water in a plastic container and pour the solution into the pool around the edge of the pool. Never add Copper Sulfate Fine Crystals while swimming. As soon as the solution disperses in the pool water, you may reenter the pool.

Using a copper test kit (this may be purchased at any pool supply store) check copper levels every 2 weeks. As needed, apply a maintenance dosage of ½ tablespoon per thousand gallons of pool water to maintain a 0.7 to 1.0 ppm concentration. Do not exceed a 1.0 ppm copper concentration. Prior to application, the pH of the pool should be 7.2-7.6. Dissolve the required amount of Copper Sulfate Fine Crystals in a plastic container and pour the solution into the pool around the edge of the pool.

Most pool shock products may be used with this product. During heavy usage, shock pool once a week and use a filter clarifier. Copper Sulfate Fine Crystals is a very simple and easy way to maintain your pool water looking crystal clear year round with very little maintenance. When used as directed Copper Sulfate Fine Crystals may be used for all pools (consult your pool professional on plaster or finished concrete pools before adding).

[Optional Claims:] This Pool Maintenance formula: Is simple to use; Has no chlorine smells; May be used with any type of filter system; Controls algae and bacterial odors; Has very little effect on pH; Unlike other products Copper Sulfate Fine Crystals will not evaporate out of your water; Compatible with most pool chemicals.

FRESHWATER SNAIL CONTROL

To kill parasites causing "swimmers itch" it is necessary to kill the various species of host snails with a maximum 1.5 ppm Copper Sulfate Fine Crystals (0.375 ppm metallic copper). In a body of water containing fish, only half of the area may be treated at once. Use the section CALCULATIONS FOR AMOUNT OF WATER AND COPPER SULFATE PENTAHYDRATE TO BE USED to calculate the amount of Copper Sulfate Pentahydrate crystals you will need to apply to the area to be treated. Apply Copper Sulfate crystals to the surface of the water or dissolve in water and make a surface spray. Keep swimmers and livestock out of the pond for 5 days following treatment; doubling this period in very soft waters. Do not make more than two applications per year. In the case where only half of the pond is being treated, it counts as half an application. In the state of New York, copper sulfate is considered a restricted use pesticide for snail control.

SEWER TREATMENT-ROOT DESTROYER

NOTE: Do not use a sewer additive where prohibited by State Law. State Law prohibits the use of this product in sewer systems in the State of Connecticut. Not for sale or use in California counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma for root control in sewers. Not for sale or use in septic systems in the State of Florida

Plant roots can penetrate through small cracks and poorly sealed joints of sewer lines. If not controlled, these small roots will continue to grow larger in number causing breakage, reduced flow and eventually flow stoppage. This product is an effective means to control roots in residential and commercial sewers.

RESIDENTIAL OR HOUSEHOLD SEWER SYSTEMS:

When a reduced water flow is first noticed, and root growth is thought to be the cause, treat with this product. It is important not to wait until a stoppage occurs because some water flow is necessary to move this product to the area of root growth. Usually, within 3 to 4 weeks, after roots have accumulated sufficient Copper Sulfate Pentahydrate, the roots will die and begin to decay and water flow should increase. As the roots regrow,

follow-up treatments with this product may be required every 6 months. Applications may be made each year in the spring after plant growth begins, during late summer or early fall, or anytime a reduced water flow, thought to be caused by root growth, occurs. Apply 1 pound of this product every six months to household sewers. Add this product to sewer lines by pouring about ½ pound increments into the toilet bowl nearest the sewer line and flush. Repeat this process until recommended dose has been added. Or remove cleanout plug and pour entire recommended quantity directly into the sewer line. Replace the plug and flush toilet several times. Do not apply Copper Sulfate through sink or tub as it will corrode metal drains. If system is equipped with septic tank, Copper Sulfate will precipitate in the septic tank and little will pass into the absorption drain field. To treat drain field pipes, add 2 pounds of Copper Sulfate once a year to the distribution box located between the septic tank and the drain field. If the distribution box does not have an opening, it would be advisable to install a clean out plug opening into the outlet pipe from the septic tank leading to the drain field for effective root control in the drain field pipes.

STORAGE AND DISPOSAL

Do not contaminate food or feed by storage or disposal.

PESTICIDE STORAGE: Store in original container and place in a locked storage area.

PESTICIDE DISPOSAL: Call your local solid waste agency for disposal instructions. Never pour unused product down the drain or on the ground.

CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container.

If empty: Offer for recycling if available or discard in a sanitary landfill. If partly filled: Call your local solid waste agency for disposal instructions. Never place unused product down any indoor or outdoor drain.

CONDITION OF SALE LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read and follow all package directions carefully. Purchaser and user assume all risks associated with improper use, or application or other factors beyond Old Bridge's control. Old Bridge warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the risks referred above.

OLD BRIDGE MAKES NO AND THE LAW SHALL NOT FIND ANY EXPRESSED OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. To the extent consistent with applicable law, purchaser's use and sole remedy against Old Bridge for any cause of action related to the handling or use of this product shall be for damages, for the amount of which shall not exceed the price paid for the product that causes the alleged loss, damages, injury, or other claim to the extent consistent with applicable law. In no event shall Old Bridge be liable for special, indirect, incidental or consequential damages or expenses. By purchasing or using this product, purchaser or user accept the foregoing conditions of sale and limitation of warranty, liability, and remedies.

ENVIRONMENTALLY HAZARDOUS SUBSTANCE SOLID, N.O.S. (CUPRIC SULFATE), 9, UN3077, PG III, RQ CAS NO. 7758-99-8

For Technical Information and MSDS Call Old Bridge Chemicals at (732) 727-2225

or e-mail: sales@oldbridgechem.com

OLD BRIDGE CHEMICALS

554 Waterworks Road

OLD BRIDGE, NEW JERSEY 08857

OLD BRIDGE CHEMICALS, INC

CLL Amendment 20140218, Edits 20140519, Edits 20140819, Edits 20140828, 20141103, 20141211, 20150123